

Project Report Appendices

The following section contains the appendices as listed in the Prince of Wales Phase II 2018 LiDAR Project Report.

Appendix A

Survey Report

Prince of Wales Island
LiDAR, Phase 2
Ground Support Survey and Mapping Report

Prepared for:
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October 2018

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LIST OF ACRONYMS

AOI Areas of Interest

GNSS Global Navigation Satellite System

GCPGround Control Point

NAD83 North American Datum 1983

NAVD88 National American Vertical Datum 1988

NGS..... National Geodetic Survey

QA Quality Assurance

QC Quality Control

RTK..... Real Time Kinematic GNSS

HORIZONTAL AND VERTICAL CONTROL SUMMARY

1.0 Introduction

This project supports the National Map 3D Elevation Program by providing ground QA/QC for LiDAR acquisition over Phase 1 of Prince of Wales Island in Southeast, Alaska. Although logging has reduced the conifer tree canopy in many areas, most of the Island is still covered with a dense canopy. The road system, developed for logging and mostly unpaved, covers only a small portion of the island and limits access to much of the island. Phase 2 concentrated on areas of the Island without road access. A helicopter was used to access most of the points.

The total project area is 1100 sq. miles inclusive of Prince of Wales Island, the Village of Kake, Metakatla and Annete Island and portions of Gravina Island. DNR Land Survey Section provided check points for the portion of the project on Prince of Wales Island which comprising 690 sq. miles of the project area.

The contract required DNR to collect a total of 91 points and cluster areas, comprising of 34 NVA and 33 VVA and 24 Cluster areas. For this project, there were 36 control points established, with one being an existing monument, 33 NVA, 39 VVA and 424 Ground Control Points (GCP) points were collected at 24 cluster areas. These points are to support Quantum Spatial's LiDAR processing and remove any bias in the dataset.

2.0 Horizontal Control Summary

CORS Station AB49 was held for project control. The data from nearby CORS station AB48, was used, but the position was not held due to the 7.5-magnitude earthquake on January 5, 2013. The survey was performed using Trimble R10 GNSS and Topcon Hiper V GNSS units and a mixture of static, fast-static and Real Time Kinematic (RTK) techniques to meet the accuracy requirements and minimize forest canopy constraints. One or more GNSS units were set up daily collecting static GNSS for additional control and to ensure accuracy requirements were met. GNSS data was processed using the current version of Trimble Business Center.

3.0 Horizontal Control Statement

Coordinates are NAD83(2011 Epoch 2010.00), UTM Zone 8, meters; NAVD88 Geoid 12b. The relative error for the RTK positions is less than 3 cm horizontal and 4 cm vertical and no points were collected with a PDOP higher than 3. All points were collected with the GNSS base station and rover seeing a minimum of six common satellites.

4.0 Vertical Control Summary & Statement

Elevations are NAVD88 as determined by Geoid12b. One tidal benchmark reference station was recovered, and the data is included, but was not used for vertical control for this project.

5.0 Survey Procedures

Static, fast-static and Real Time Kinematic (RTK) GNSS surveying methods were used to collect the data. In addition to the CORS, a GNSS base station was set up each day to collect static data concurrent with the survey field work. Control Points, consisting of a spike or Mag nail were established at collection areas using both fast-static and static methods. NVA and VVA points were collected using RTK, or higher accuracy methods with data collector configurations that prohibited collection of points with greater than 3 cm horizontal, 4 cm vertical, and an PDOP above 3.

6.0 Quality Assurance

Quality Assurance (QA) methods and procedures outlined in the contract were followed including the following:

- All rods, tribrach's, bipods, and equipment were tested and adjusted as necessary prior to being used in the field.
- Redundant measurements were made in feet and meters both at the beginning and at the end of each GNSS setup or fixed height rods were used.
- Data was downloaded and checked each night.
- Preprinted field books were used to ensure each crew logged the same data.

7.0 Surveyor's Certification

I, Gwendolyn M. Gervelis, Alaska Land Surveyor # 13320, do hereby certify that the information contained herein is the result of work performed by me and by my crew working under my direct supervision.



